



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

April 24, 2020

Mr. Matthew Rasmussen Site
Vice President Sequoyah
Nuclear Plant Tennessee
Valley Authority
P.O. Box 2000, OPS 4A-SQN
Soddy Daisy, TN 37384-2000

SUBJECT: SEQUOYAH NUCLEAR PLANT – NRC OPERATOR LICENSE EXAMINATION
REPORT 05000327/2020301 AND 05000328/2020301

Dear Mr. Rasmussen:

During the period March 2 – March 12, 2020, the Nuclear Regulatory Commission (NRC) administered operating tests to employees of your company who had applied for licenses to operate the Sequoyah Nuclear Plant, Units 1 & 2. At the conclusion of the tests, the examiners discussed preliminary findings related to the operating tests and the written examination submittal with those members of your staff identified in the enclosed report.

The written examination was administered by your staff on March 18, 2020.

Ten Reactor Operator (RO) and six Senior Reactor Operator (SRO) applicants passed both the operating test and written examination. One SRO applicant failed the written examination. There were two post-administration comments concerning the written examination. These comments, and the NRC resolution of these comments, are summarized in Enclosure 2. A Simulator Fidelity Report is included in this report as Enclosure 3.

The initial examination submittal was within the range of acceptability expected for a proposed examination. All examination changes agreed upon between the NRC and your staff were made according to NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 11.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

M.Rasmussen

If you have any questions concerning this letter, please contact me at (404) 997-4551.

Sincerely,

/RA/

Gerald J. McCoy, Chief
Operations Branch 1
Division of Reactor Safety

Docket Nos: 50-327, 50-328
License Nos: DPR-77, DPR-79

Enclosures: 1. Report Details
2. Facility Comments and NRC Resolution
3. Simulator Fidelity Report

cc: Distribution via Listserv

SUBJECT: SEQUOYAH NUCLEAR PLANT – NRC OPERATOR LICENSE EXAMINATION
REPORT 05000327/2020301 AND 05000328/2020301 dated April 24, 2020

☐ PUBLICLY AVAILABLE ☒ NON-PUBLICLY AVAILABLE ☒ SENSITIVE ☐ NON-SENSITIVE
ADAMS: ☒ Yes **ACCESSION NUMBER ML20115E422** ☒ SUNSI REVIEW COMPLETE ☐ FORM 665 ATTACHED

OFFICE	RII/DRS/OL1	RII/DRS/OL1				
NAME	G. McCoy	B. Caballero				
DATE	04/24/2020	04/23/2020				
E-MAIL COPY?	YES NO	YES NO				

OFFICIAL RECORD

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 05000327, 05000328

License No.: DRP-77, DRP-79

Report No.: 05000327/2020301 and 05000328/2020301

EPID No.: 2020-OLL-0021

Licensee: Tennessee Valley Authority

Facility: Sequoyah Nuclear Plant

Location: Soddy-Daisy, TN

Dates: Operating Test – March 2 – 12, 2020
Written Examination – March 18, 2020

Examiners: Bruno Caballero, Chief Examiner, Senior Operations Engineer
Phil Capehart, Senior Operations Engineer
Dave Dumbacher, Senior Operations Engineer
Jason Bundy, Operations Engineer
Newton Lacy, Operations Engineer

Approved by: Gerald McCoy, Chief
Operations Branch 1
Division of Reactor Safety

SUMMARY

ER 05000327/2020301, 05000328/2020301; March 2 – 12, 2020 & March 18, 2020; Sequoyah Nuclear Plant; Operator License Examinations.

Nuclear Regulatory Commission (NRC) examiners conducted an initial examination in accordance with the guidelines in Revision 11 of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors." This examination implemented the operator licensing requirements identified in 10 CFR §55.41, §55.43, and §55.45, as applicable.

Members of the Sequoyah Nuclear Plant staff developed both the operating tests and the written examination. The initial operating test, written RO examination, and written SRO examination submittals met the quality guidelines contained in NUREG-1021.

The NRC administered the operating tests during the period March 2 – 12, 2020. Members of the Sequoyah Nuclear Plant training staff administered the written examination on March 18, 2020. All Reactor Operator (RO) and six Senior Reactor Operator (SRO) applicants passed both the operating test and written examination. Sixteen applicants were issued licenses commensurate with the level of examination administered.

There were two post-examination comments.

No findings were identified.

REPORT DETAILS

4. OTHER ACTIVITIES

4OA5 Operator Licensing Examinations

a. Inspection Scope

The NRC evaluated the submitted operating test by combining the scenario events and JPMs in order to determine the percentage of submitted test items that required replacement or significant modification. The NRC also evaluated the submitted written examination questions (RO and SRO questions considered separately) in order to determine the percentage of submitted questions that required replacement or significant modification, or that clearly did not conform with the intent of the approved knowledge and ability (K/A) statement. Any questions that were deleted during the grading process, or for which the answer key had to be changed, were also included in the count of unacceptable questions. The percentage of submitted test items that were unacceptable was compared to the acceptance criteria of NUREG-1021, "Operator Licensing Standards for Power Reactors."

The NRC reviewed the licensee's examination security measures while preparing and administering the examinations in order to ensure compliance with 10 CFR §55.49, "Integrity of examinations and tests." During the on-site preparatory week (January 27 – 31, 2020) the NRC audited a sample (approximately 10%) of the license applications (i.e., NRC Form 398) to confirm they accurately reflected the subject applicants' qualifications.

The NRC administered the operating tests during the period March 2 – 12, 2020. The NRC examiners evaluated ten Reactor Operator (RO) and seven Senior Reactor Operator (SRO) applicants using the guidelines contained in NUREG-1021. Members of the Sequoyah Nuclear Plant training staff administered the written examination on March 18, 2020. Evaluations of applicants and reviews of associated documentation were performed to determine if the applicants, who applied for licenses to operate the Sequoyah Nuclear Plant, Units 1 and 2, met the requirements specified in 10 CFR Part 55, "Operators' Licenses."

The NRC evaluated the performance or fidelity of the simulation facility during the preparation and conduct of the operating tests.

b. Findings

No findings were identified.

The NRC developed the written examination sample plan outline. Members of the Sequoyah Nuclear Plant training staff developed both the operating test and the written examination. All examination material was developed in accordance with the guidelines contained in Revision 11, of NUREG-1021. The NRC examination team reviewed the proposed examination. Examination changes agreed upon between the NRC and the licensee were made per NUREG-1021 and incorporated into the final version of the examination materials.

The NRC determined, using NUREG-1021, that the licensee's initial examination submittal was within the range of acceptability expected for a proposed examination.

Ten RO applicants and six SRO applicants passed both the operating test and written examination. One SRO applicant passed the operating test but did not pass the written examination. Ten RO applicants and six SRO applicants were issued licenses.

Copies of all individual examination reports were sent to the facility Training Manager for evaluation of weaknesses and determination of appropriate remedial training.

The facility licensee and applicants submitted two post-examination comments concerning the written examination and these comments may be accessed in the ADAMS system (ADAMS Accession Number ML20106F071). A copy of the final written examination and answer key, with all changes incorporated, may be accessed not earlier than April 14, 2022, in the ADAMS system (ADAMS Accession Numbers ML20106F073 and ML20106F099).

4OA6 Meetings, Including Exit

Exit Meeting Summary

On March 12, 2020 the NRC examination team discussed generic issues associated with the operating test with Mr. Samuel Nakamine, Operations Superintendent, and members of the Sequoyah Nuclear Plant staff. The examiners asked the licensee if any of the examination material was proprietary. No proprietary information was identified.

KEY POINTS OF CONTACT

Licensee personnel

Samuel Nakamine, Operations Superintendent
Tim Rieger, Operations Training Manager
Rusty Whitehead, Operations Training Liason
John Ward, Initial License Training Supervisor
Aaron Forsha, Exam Author
Max Hime, Exam Room Instructor
Matthew Mc Mullin, Corporate Operations Training Manager
Russell Joplin, Corporate Exam Manager

NRC personnel

David Hardage, NRC Senior Resident Inspector

FACILITY AND APPLICANT POST-EXAMINATION COMMENTS AND NRC RESOLUTIONS

A complete text of the facility licensee and applicants' post-examination comments can be found in ADAMS under Accession Number ML20106F071. The facility licensee AND applicant post-examination comments were the same for two written exam SRO test items, #87 and #94.

Post-Examination Comment #1: SRO Question #87

The facility licensee and one applicant contended that the answer key for Question #87 was incorrect; the facility and applicant contended the only correct answer was Choice "C", even though the answer key indicated Choice "D" was the correct answer.

Specifically, the facility licensee and applicant contended Reactor Trip Breaker "A" (RTA) remained OPERABLE after 125VDC Battery Board 1 was lost because Tech Spec 3.3.1, Reactor Trip System Instrumentation, included two separate Functions, i.e., Function 17, Reactor Trip Breakers, and Function 18, Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms.

The facility and applicant contended that the bases for Tech Spec 3.3.1, Function 17 stated that the Undervoltage and Shunt Trip features were exclusive of Function 17, and that the stem of the question was only testing Function 17.

Background

Question #87 was a two-part question, as follows:

87. Given the following plant conditions:

- Unit 1 is in MODE 2.
- A loss of 125 VDC Vital Battery Board I occurs.

Which one of the following completes the statements below?

RTA (reactor trip breaker A) main control board indication (1) available.

In accordance with Basis of LCO 3.3.1 "RTS Instrumentation" RTA (2) OPERABLE.

- | | (1) | (2) |
|----|---------------|---------------|
| A. | is | remains |
| B. | is | is NOT |
| C. | is NOT | remains |
| D. | is NOT | is NOT |

The answer key indicated that Choice "D" was the correct answer. Neither the facility licensee nor any of the applicants contested the first portion of the test item. The second part of the question tested whether the "A" reactor trip breaker (RTA) remained operable after 125 VDC Vital Battery Board 1 was lost. Four of the seven applicants picked Choice "C" as the correct answer, i.e., "RTA remains operable." The other three applicants picked Choice "D." None of

the applicants asked the proctor a question about this test item during the administration of the exam.

NRC Resolution: Facility Licensee and Applicant comment accepted

The second part of the question tested whether reactor trip BREAKER "A", was operable following a loss of 125VDC Battery Board 1. The shunt trip coil inside RTA received 125 VDC power from 125 VDC Battery Bd 1. Therefore, following a loss of 125VDC Battery Board 1, RTA no longer had its shunt trip mechanism feature available. However, RTA still had the ability to automatically trip open from its 48 VDC undervoltage coil.

The BREAKER was identified as Function 17 in Tech Spec 3.3.1. The Basis for Function 17 stated that the breaker function did NOT pertain to the trip mechanism features (48 VDC Undervoltage Coil and 125 VDC Shunt Trip Coil) because these features were separately identified as Function 18 in Tech Spec 3.3.1.

The bases for Tech Spec 3.3.1, Function 17, stated, in part:

17. Reactor Trip Breakers

This trip Function applies to the reactor trip breakers exclusive of individual trip mechanisms. There are two Reactor Trip Breakers arranged in a one-out-of-two logic. The LCO requires two OPERABLE trains of trip breakers. A trip breaker train consists of all trip breakers associated with a single RTS logic train that are racked in, closed, and capable of supplying power to the Rod Control System. Thus, the train may consist of the main breaker, bypass breaker, or main breaker and bypass breaker, depending upon the system configuration. Two OPERABLE trains ensure no single random failure can disable the RTS trip capability.

The bases for Function 18, Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms, stated:

18. Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms

The LCO requires both the Undervoltage and Shunt Trip Mechanisms to be OPERABLE for each reactor trip breaker that is in service. The trip mechanisms are not required to be OPERABLE for trip breakers that are open, racked out, incapable of supplying power to the Rod Control System, or declared inoperable under Function 17 above. OPERABILITY of both trip mechanisms on each breaker ensures that no single trip mechanism failure will prevent opening any breaker on a valid signal.

These trip Functions must be OPERABLE in MODE 1 or 2 when the reactor is critical. In MODE 3, 4, or 5, these RTS trip Functions must be OPERABLE when the Rod Control System is capable of rod withdrawal or one or more rods are not fully inserted.

In accordance with the Basis of LCO 3.3.1, Reactor Trip System Instrumentation, the Reactor Trip BREAKER function remained operable following the loss of 125 VDC Vital Battery Board 1 because:

- 1) the reactor trip breaker orientation was still configured such that two operable in series breakers (RTA and RTB) would automatically open during an automatic Solid-State Protection System (SSPS) trip via the 48 VDC Undervoltage Coil, and
- 2) the trip mechanism features (125 VDC Shunt Trip Coil and 48 VDC Undervoltage Coil) were exclusive of the BREAKER Function 17. The trip mechanism features were contained in Function 18, Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms.

The second part of the question was:

In accordance with the Basis of LCO 3.3.1, RTS Instrumentation, RTA_____operable.

The acronym "RTA" was defined in the 1st fill-in-the-blank statement as "reactor trip breaker A." This acronym was also used on the Main Control Board Panel 1-M-4 under the RTA indicating light.

The word "breaker" was used in the title of Function 17 and Function 18, i.e.,

17. Reactor Trip Breakers

18. Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms

However, the fill-in-the-blank statement only asked about the BREAKER, which was Function 17. The fill-in-the-blank statement did not specify trip mechanisms.

- When Function 17 was not operable, Required Condition "N" was required to be entered, which was a 24-hour action.
- If Function 18 was not operable, Required Condition "Q" was required to be entered, which was a 48-hour action.

Following the loss of 125 VDC Battery Board 1, RTA was still operable because of its redundant 48 VDC Undervoltage Coil, which was still capable of causing an automatic reactor trip via SSPS. Because the breaker trip capability remained operable, the less limiting Condition "Q" 48-hour required action was allowed.

In accordance with NUREG-1021, Operator Licensing Examination Standards for Power Reactors, Rev. 11, Appendix E, Policies and Guidelines for Taking NRC Examinations, Section B.7 stated:

"When answering a question, do not make assumptions regarding conditions that are not specified in the question unless they occur as a consequence of other conditions that are stated in the question."

The fill-in-the-blank statement only asked about reactor trip BREAKER "A." Therefore, the applicants' and facility licensee's recommendation that the answer key be changed to Choice "C" as the only correct answer was accepted.

Post-Examination Comment #2: SRO Question #94

The facility licensee and one applicant contended that Question #94 should be deleted from the examination because the stem of the question did not provide information related to the Work Control Center (WCC) Senior Reactor Operator (SRO) qualifications for the Incident Commander position. The facility and the applicant contended that Choices "A" and "B" were both correct for the second part of the question, depending on whether the WCC SRO was qualified to be an Incident Commander, but these Choices were mutually exclusive, and the entire question should be deleted.

Background

Question #94 was a two-part question, as follows:

94. Given the following:

A Work Control Center (WCC) SRO has previously held a SRO license at SQN, but does not currently hold a SRO license.

In accordance with OPDP-1 "Conduct of Operations" which of the following completes the statements below?

This WCC SRO (1) authorize switchyard access.

This WCC SRO (2) be the incident commander.

- | | (1) | (2) |
|----|----------------|----------------|
| A✓ | can | can |
| B. | can | can NOT |
| C. | can NOT | can |
| D. | can NOT | can NOT |

The answer key indicated that Choice "A" was the correct answer. None of the applicants chose the correct answer. Four of the seven applicants picked Choice "B" as the correct answer, one of the applicants picked Choice "C", and two of the applicants picked Choice "D." None of the applicants asked the proctor a question about this test item during the administration of the exam.

NRC Resolution: Facility Licensee and Applicant comment NOT accepted

The question was developed to test the applicants' knowledge of Items A.3, B.1, and B.11 in OPDP-1, Conduct of Operations, Section 3.1.9, Work Control Center SRO, which stated:

3.1.9 Work Control Center SRO

A. The individual assigned to WCC SRO duties administratively reports to the SM and is under functional direction of the NUSO. There are three qualification levels for the position of WCC-SRO.

1. The WCC SRO is qualified if currently holding an SRO license.
2. The WCC SRO is qualified if the individual is a watch-qualified STA with a SRO Certification.

In this case, the individual may sign documents normally signed by the NUSO, but cannot sign where an SRO signature is required.

3. The WCC SRO is qualified if the individual has held an SRO license at the facility. In this case, the individual may sign documents normally signed by the NUSO but cannot sign where an SRO signature is required. The individual must meet site specific training requirements.

B. Typical WCC SRO duties may include the following:

1. Switchyard access authorization.
2. Review work documents for operability, operational impact, and to ensure the plants procedural and regulatory requirements are maintained.
3. Authorize and approve work documents for work on plant equipment.
4. Provide a focal point for the clearing of equipment for support of maintenance activities; review and approve clearance requests and clearances.
5. Initiate and prioritize emergent work issues.
6. Maintain a point of contact for schedule implementation and the coordination of work with the Work Week Manager.
7. Provide interface between the SM, NUSO, and other groups.
8. Review and ensure the adequacy of post maintenance/modification testing (PMT) when equipment is returned to service.
9. Issue and release of permits as required.
10. FIN Team Coordination.
11. Incident Commander.
12. Ensure LCO Tracking maintained in accordance with approved procedures.
13. Track progress on critical work activities such as LCO or system work windows.
14. Assist SM in performing operability, risk, and reportability determinations.

OPDP-1, Conduct of Operations, Section 3.1.9.A.3 stated that a WCC SRO who previously held a SRO license “*must meet site specific training requirements.*”

The site-specific training requirements for the Incident Commander position at Sequoyah were identified in the SQN Fire Protection Report, Part II – Fire Protection Plan, and in the Learning Management System (LMS), as:

- *“The Incident Commander is a Unit Supervisor (or equivalent) and has sufficient training in or knowledge of plant safety related systems to understand the effects of fire and fire suppressants on safe shutdown capability.”* [Fire Protection Report, Section 9.1, Fire Brigade Staffing]
- *“Medical evaluation to ensure ability to perform the strenuous physical activity to wear special respiratory equipment, and for unescorted access to nuclear plants.”* [Fire Protection Report, Section 9.3, Training and Qualifications]
- *“Initial and recurrent training which includes periodic instruction, fire drills and annual fire brigade training.”* [Fire Protection Report, Section 9.3, Training and Qualifications]
- Sequoyah SRO NRC license [Learning Management System]
- Completion of FPT 212.000, SQN Incident Commander Training – Intro, Duties and Responsibilities. [Learning Management System]

The stem of the question identified that the WCC SRO was previously licensed; however, it did not specify whether the WCC SRO completed the medical and training evaluations listed above for the Incident Commander position. The applicants were forced to make an assumption regarding the WCC SRO’s completion of the medical and training evaluations necessary for the Incident Commander position because the stem did not provide this necessary information.

In accordance with NUREG-1021, Appendix E, Policies and Guidelines for Taking NRC Examinations, Section B.7 stated, in part:

“When answering a question, do not make assumptions regarding conditions that are not specified in the question unless they occur as a consequence of other conditions that are stated in the question.”

In accordance with NUREG-1021, Operator Licensing Examination Standards for Power Reactors, Rev. 11, ES-403, Grading Initial Site-Specific Written Examinations, Section D.1.b stated, in part:

The following types of errors, if identified and adequately justified by the facility licensee or an applicant, are most likely to result in post-examination changes agreeable to the NRC:

- *A question with an unclear stem that confused the applicants or did not provide all the necessary information.*

Therefore, Choices “A” and “B” were both correct for the second part of the question, depending on the WCC SRO’s Incident Commander qualifications.

However, Choices “C” and “D” were incorrect because the WCC SRO was qualified to grant switchyard access by virtue of the WCC SRO position. Specifically, OPDP-2, Switchyard Access and Switching Order Execution, stated, in part:

3.6 Transformer Yard/Switchyard Access

- A. Entry into the switchyard shall be controlled by the Shift Manager or designee. Prior approval by the SM or designee is required for any person that desires access to perform work whose normal work station is not in the switchyard. Switchyard/transformer yard entry and exit of personnel who require approval shall be tracked on Form OPDP-2-2.

OPDP-1, Conduct of Operations, Section 3.1.9.B.1, stated, in part:

- B. Typical WCC SRO duties may include the following:

- 1. Switchyard access authorization.

There was no site-specific training that WCC SROs were required to complete for authorizing switchyard access; the WCC SRO was required to implement OPDP-2, Switchyard Access and Switching Order Execution, for switchyard access. Therefore, the first part of the question was not flawed.

ES-403, Section D.1.c also stated, in part:

If a question is determined to have two correct answers, both answers will be accepted as correct. If, however, both answers contain conflicting information, the question will likely be deleted. For example, if part of one answer states that operators are required to insert a manual reactor scram, and part of another answer states that a manual scram is not required, then it is unlikely that both answers will be accepted as correct, and the question will probably be deleted.

Because the stem was missing information, the applicants were forced to make an assumption that the WCC SRO had (or had not) completed the medical and training evaluations to be an Incident Commander – either assumption was valid. Choices “A” and “B” did not conflict because each choice was operationally valid and was administratively allowed, dependent on the WCC SRO’s Incident Commander qualification.

Question #94 was a two-part question and the first part of the question was valid. Therefore, the two applicants who chose Choice “D” did not possess the requisite knowledge that switchyard access authorization was a typical WCC SRO duty. Precedence existed for NRC written examination answer key changes involving two-part questions where two correct answers were accepted for one part of the question and the question was not deleted from the exam (ML15212A744), involving multi-regional and program office concurrences.

Therefore, the applicants’ and facility licensee’s recommendation that the question be deleted was NOT accepted because the first part of the question remained valid and the second part of the question had two answers that did not operationally or administratively conflict. Instead, the answer key was changed so that Choices “A” and “B” were both correct.

SIMULATOR FIDELITY REPORT

Facility Licensee: Sequoyah Nuclear Plant

Facility Docket No.: 05000327, 05000328

Operating Test Administered: March 2 – 12, 2020

This form is to be used only to report observations. These observations do not constitute audit or inspection findings and, without further verification and review in accordance with Inspection Procedure 71111.11 are not indicative of noncompliance with 10 CFR 55.46. No licensee action is required in response to these observations.

While conducting the simulator portion of the operating test, examiners observed the following:

<u>Item</u>	<u>Description</u>
Simulator Work Order #5878	<p>Two simulator issues were identified during the administration of the NRC operating test job performance measures (JPMs).</p> <p>During JPM G (Transfer 1A-A Shutdown Board from Alternate to Normal), the Diesel Generator 1A Lockout Reset Switch (1-HS-82-20) did not reset the lockout even though the applicant depressed the switch several times.</p> <p>During JPM F (Phase A Fails for Steam Generator Blowdown and Glycol isolation valves), the Glycol Supply to the Air Handling Units Switch (1-HS-61-191A) did not open the valves on two of the 13 times the JPM was administered.</p>